DEVELOPMENT OF SCIENCE VIRTUAL TEST ON LEVELS OF ORGANIZATIONS AND CELL TRANSPORT TOPIC (SVT-LOCT) TO ASSESS JUNIOR HIGH SCHOOL STUDENTS' SCIENCE PROCESS SKILLS

RESEARCH PAPER

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Skripsi yang diajukan untuk memenuhi salah satu syarat untuk memperoleh gelar Sarjana Pendidikan pada Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam

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DECLARATION

I do hereby declare with respect that every aspect is written in research paper entitled "Development of Science Virtual Test on Levels of Organizations and Cell Transport Topic (SVT-LOCT) to Assess Junior High School Students' Science Process Skills" is genuinely pure result of my own original ideas, effort, research, work, and not copied or plagiarized from other papers. The opinions or findings of experts and others contained in this paper have been quoted or referenced based on scientific code from UPI and in accordance with ethical science that applies in scholarly society. This declaration is created truthfully and consciously, when subsequently is found an infringement towards scientific ethics, or if there is a claim of any others towards the authenticity of this research paper, hence I am willing to be responsible and accept academicals sanctions correspond to applicable rules.

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ABSTRACT

Assessment of science process skills is one of the methods in developing students' level of process skills. However, the assessment of the issue could hardly be found especially in the specific topic of science. This condition prompted the researcher to develop and validate a test to assess students' science process skills in levels of organization and cell transport topic. In general, the development process of the test consists of 5 steps: (1) content analysis; (2) construction of multiple-choice test items; (3) readability test and validation by experts; (4) small group try out; (5) implementation of larger scale test. Based on the larger scale test, it was obtained the validity and reliability value, discriminating power, quality of distractor, and difficulty index. The subjects of this research are 7th grade students of private international Junior High School in Kabupaten Bandung. The total of the respondents was 118 students. The method of this research was developmental research. The validation of instrument resulted in 31 items that represent 8 skills and 27 indicators to assess students' science process skills on levels of organization and cell transport topic. The instrument is Science Virtual Test on Levels of Organization and Cell Transport (SVT-LOCT). The alpha Cronbach (α) is 0.753 and the correlation of R_{xy} is 0.63 which means that the instrument is considered as appropriate to assess students' science process skills. The result of students' science process skills also shows that 59% of the students have 'moderate' level of science process skills, and students' respond was positive.

Keyword: science virtual test, science process skills, levels of organization, cell transport

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ABSTRAK

Asesmen dalam keterampilan proses sains yang efektif dalam mengembangkan tingkat keterampilan proses siswa. Namun, hal tersebut sulit ditemukan terutama dalam topik sains tertentu. Kondisi ini mendorong peneliti untuk mengembangkan dan memvalidasi tes untuk menilai keterampilan proses sains siswa dalam topik Sistem Organisasi Kehidupan dan Transportasi Sel. Tujuan dari penelitian ini adalah untuk mengembangkan dan memvalidasi *science virtual test* untuk mengukur keterampilan proses sains siswa dalam topik Sistem Organisasi Kehidupan dan Transportasi Sel. Secara umum, proses pengembangan *science virtual test* terdiri dari 5 langkah: (1) analisa materi; (2) pembuatan instrumen tes pilihan ganda berdasarkan kemampuan proses sains; (3) uji keterbacaan oleh siswa dan guru, serta uji validitas oleh ahli; (4) Uji coba kelompok kecil; (5) uji skala besar. Berdasarkan uji skala besar, diperoleh nilai validitas dan reliabilitas, daya pembeda, kualitas pengecoh, dan indeks kesukaran. Subjek dalam penelitian adalah siswa kelas 7 sekolah swasta bertaraf internasional di Kabupaten Bandung. Total responden penelitian ini sebanyak 118 siswa. Penelitian ini menggunakan metode pengembangan penelitian. Hasil validasi instrumen tes menghasilkan 31 butir soal yang mewakili 8 keterampilan proses dan 27 indikator untuk menilai keterampilan proses sains siswa pada topik Sistem Organisasi Kehidupan dan Transportasi Sel. Instrumen ini disebut sebagai Tes Virtual Sains dalam topik Sistem Organisasi Kehidupan dan Transportasi Sel (SVT-LOC). Koefisien alpha (α) instrumen sebesar 0,753 dan koefisien Rxy sebesar 0.63 berarti instrumen dianggap sesuai untuk menilai keterampilan proses sains siswa. Hasil keterampilan proses sains siswa juga menunjukkan bahwa 59% siswa memiliki tingkat keterampilan proses sains 'sedang', dan siswa merespons secara positif terhadap SVT-LOCT.

Kata kunci: science virtual test, keterampilan proses sains, sistem organisasi kehidupan, transportasi sel

PREFACE

Alhamdulillahirrabbil'alamin, all praises to Allah SWT, the cherister and sustainer of the world who has been giving His blessings and mercy to the author to complete the research paper entitled as "Development of Science Virtual Test on Levels of Organizations and Cell Transport Topic (SVT-LOCT) to Assess Junior High School Students' Science Process Skills". *Sholawat* and *salam* may always be delivered to the best human being, our prophet Muhammad SAW, to all his family, relatives, and also to all of the Muslims in the world till the end.

The research was conducted to develop the science virtual test item to assess students' science process skills based on Rustaman's and Rezba's process skills. This research is partial requirements in Universitas Pendidikan Indonesia students in educational major to finish the study and to achieve *Sarjana Pendidikan*.

The perfection only belongs to Allah SWT, the author realized that the paper still has many unintended error that have to be improved. Therefore, suggestions to improve the quality of the science virtual test in the future is very much needed. Hopefully, this research paper can be useful and can be more improved by other researcher.

Bandung, August 2019

The Author

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The Author

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